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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|--|-------------|----------------------|------------------------|------------------|
| 10/679,782 | 10/06/2003 | Marie Angelopoulos | FIS920030196US1 | 3728 |
| 23389 | 7590 | 06/14/2006 | | |
| SCULLY SCOTT MURPHY & PRESSER, PC 400 GARDEN CITY PLAZA SUITE 300 GARDEN CITY, NY 11530 | | | | |
| | | | EXAMINER LEE, SIN J | |
| | | | ART UNIT 1752 | PAPER NUMBER |

DATE MAILED: 06/14/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

| | | | |
|------------------------------|--------------------------------------|--|--|
| Office Action Summary | Application No. 10/679,782 | Applicant(s) ANGELOPOULOS ET AL. | |
| | Examiner Sin J. Lee | Art Unit 1752 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 March 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 2-31 is/are pending in the application.
- 4a) Of the above claim(s) 14-29 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 2-13,30 and 31 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☒ Claim(s) 2-31 are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 06 October 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

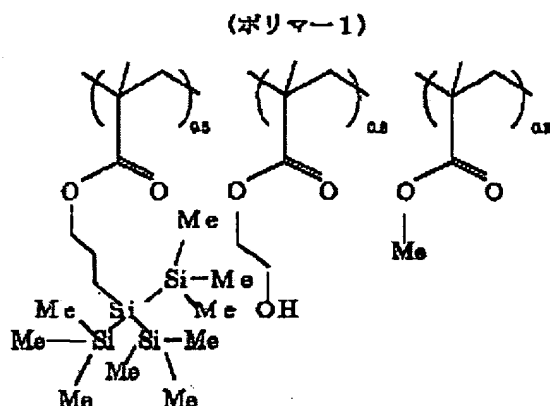
1. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

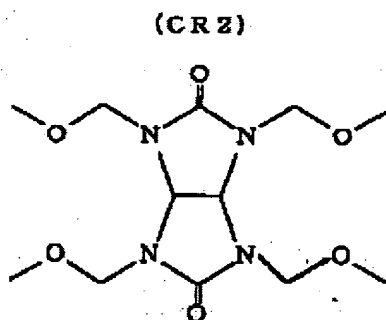
Claim Rejections - 35 USC § 103

2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.
3. Claims 2-13, 30 and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hatakeyama et al (JP 2002-107938 and its machine-assisted English translation provided by JPO) in view of Angelopoulos et al (US 6,420,088 B1) and Pavelcheck et al (US 6,767,689 B2).

In Table 1 (see [0048] and abstract), Hatakeyama teaches an antireflective coating composition No.6 containing a polymer 1, a crosslinking agent CR2, an acid generator AG 1. Hatakeyama's Polymer 1 is shown below (see [0043]):

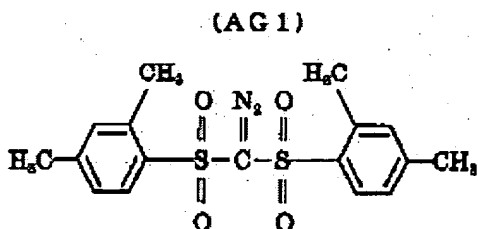


Hatakeyama's CR2 is shown below (see [0045]):



, and this compound teaches present glycoluril crosslinking component.

Hatakeyama's AG 1 is shown below (see [0045]):



Hatakeyama's Polymer 1 shown above contains present Si-(Si)_n moieties of Formula III and present reactive site of alcohol ($-CH_2-CH_2-OH$).

Hatakeyama does not teach present chromophore moieties in its polymer shown above. Angelopoulos et al teaches (col.1, lines 63-67, col.2, lines 1-3) a polymer (used

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in antireflective composition) having *pendant chromophore* moieties. Angelopoulos teaches that such polymer provides an antireflective composition having outstanding optical, mechanical and dry etch selectivity properties. As a preferred chromophore group, Angelopoulos teaches 9-anthracenemethyl group (see Example 1 and col.4, line 17). Besides, as evidenced by Pavelcheck et al, it is also known in the art to use a resin having pendant chromophore groups in an antireflective composition in order to absorb undesired radiation used to expose an overacted resist layer from reflecting back into the resist layer (see col.2, lines 41-61). Based on the teachings of Angelopoulos and Pavelcheck, it would have been obvious to one skilled in the art to incorporate a chromophore moiety (such as 9-anthracenemethyl group) as a pendant group into Hatakeyama's polymer in order to obtain an antireflective composition having outstanding optical, mechanical and dry etch selectivity properties and also to absorb undesired radiation used to expose the overacted resist layer from reflecting back into the resist layer. Therefore, Hatakeyama in view of Angelopoulos and Pavelcheck would render obvious present silicon polymer of claims 3, 30 and 31 and thus render obvious present inventions of claims 2-13, 30 and 31.

Response to Arguments

4. Applicants argue that Hatakeyama believes that the disadvantage of the prior art materials, i.e., the relatively low dry etching selection ratio to photoresist is caused by the presence of the absorbing agents containing aromatic radicals and/or double bonds. Applicants thus argue that Hatakeyama specifically teach away from using any absorbing agents containing aromatic radicals and/or double bonds. However, it is to

be noted that although Hatakeyama does mention the disadvantage of introducing absorbing agents (with aromatic radicals and/or double bonds) into a binder polymer in those prior art materials, Hatakeyama is not saying that those absorbing agents can not be used for his inventive polymer. In fact, in the English abstract, for his formula (1), Hatakeyama teaches that those R_2-R_{10} can be an *aryl group of 6-20 carbon atoms* as well as *cyclic alkyl group* optionally substituted by F atoms. Therefore, the Examiner disagrees with applicants' argument that Hatakeyama specifically teach away from using any absorbing agents containing aromatic radical and/or double bonds.

Applicants also argue that neither Angelopoulos nor Pavelcheck suggest that the chromophore moieties disclosed therein may be introduced into an antireflective coating composition comprising a polymer having Si-(Si) $_n$ moieties. However, since Hatakeyama's polymer itself could contain aryl group of 6-20 carbon atoms (as discussed above), it is still the Examiner's position that one skilled in the art would have been motivated to incorporate a chromophore moiety, such as 9-anthracenemethyl group, as a pendant group into Hatakeyama's polymer in order to obtain an antireflective composition having outstanding optical, mechanical and dry etch selectivity properties and also to absorb undesired radiation used to expose the overacted resist layer from reflecting back into the resist layer.

For the reasons stated above, present rejection over Hatakeyama et al in view of Angelopoulos and Pavelcheck still stands.

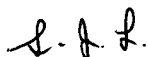
5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sin J. Lee whose telephone number is 571-272-1333.

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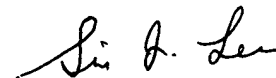
The examiner can normally be reached on Monday-Friday from 9:00 am EST to 5:30 pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Cynthia Kelly, can be reached on 571-272-1526. The fax phone number for the organization where this application or proceeding is assigned is **571-273-8300**.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



S. Lee
June 12, 2006



SIN LEE
PRIMARY EXAMINER